

UTILITY
PATENT APPLICATION
TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.

35.C14516

First Named Inventor or Application Identifier

AKIHIKO NODA

Express Mail Label No.

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO:

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1. ☐ Fee Transmittal Form
(Submit an original, and a duplicate for fee processing)

2. ☒ Specification Total Pages

3. ☒ Drawing(s) (35 USC 113) Total Sheets

4. ☒ Oath or Declaration Total Pages

a. ☒ Newly executed (original or copy)

b. ☐ Unexecuted for information purposes

c. ☐ Copy from a prior application (37 CFR 1.63(d))
(for continuation/divisional with Box 17 completed)
[Note Box 5 below]

i. ☐ DELETION OF INVENTOR(S)
Signed Statement attached deleting inventor(s)
named in the prior application, see 37 CFR
1.63(d)(2) and 1.33(b).

5. ☐ Incorporation By Reference (useable if Box 4c is checked)
The entire disclosure of the prior application, from which a copy of the
oath or declaration is supplied under Box 4c, is considered as being
part of the disclosure of the accompanying application and is hereby
incorporated by reference therein.

6. ☐ Microfiche Computer Program (Appendix)

7. Nucleotide and/or Amino Acid Sequence Submission
(if applicable, all necessary)

a. ☐ Computer Readable Copy

b. ☐ Paper Copy (identical to computer copy)

c. ☐ Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

8. ☒ Assignment Papers (cover sheet & document(s))

9. ☐ 37 CFR 3.73(b) Statement ☐ Power of Attorney
(when there is an assignee)

10. ☐ English Translation Document (if applicable)

11. ☐ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS
Citations

12. ☐ Preliminary Amendment

13. ☒ Return Receipt Postcard (MPEP 503)
(Should be specifically itemized)

14. ☐ Small Entity ☐ Statement filed in prior application
Statement(s) Status still proper and desired

15. ☐ Certified Copy of Priority Document(s)
(if foreign priority is claimed)

16. ☐ Other: _____

17. If a CONTINUING APPLICATION, check appropriate box and supply the requisite information:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No. ____/____

18. CORRESPONDENCE ADDRESS

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CLAIMS	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
	TOTAL CLAIMS (37 CFR 1.16(c))	16-20	0	X \$ 18.00 =	\$ 0
	INDEPENDENT CLAIMS (37 CFR 1.16(b))	3-3 =	0	X \$ 78.00 =	\$ 0
	MULTIPLE DEPENDENT CLAIMS (if applicable) (37 CFR 1.16(d))			\$260.00 =	0
				BASIC FEE (37 CFR 1.16(a))	\$ 690.00
	Total of above Calculations =				\$ 690.00
	Reduction by 50% for filing by small entity (Note 37 CFR 1.9, 1.27, 1.28).				
	TOTAL =				\$ 690.00

19. Small entity status

- a. ☐ A Small entity statement is enclosed
- b. ☐ A small entity statement was filed in the prior non-provisional application and such status is still proper and desired.
- c. ☐ Is no longer claimed.

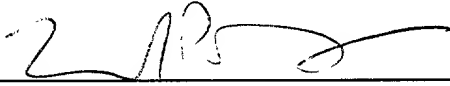
20. ☒ A check in the amount of \$690.00 to cover the filing fee is enclosed.

21. ☒ A check in the amount of \$40.00 to cover the recordal fee is enclosed.

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- a. ☒ Fees required under 37 CFR 1.16.
- b. ☒ Fees required under 37 CFR 1.17.
- c. ☐ Fees required under 37 CFR 1.18.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

NAME	Leonard P. Diana (Reg. No. 29,296)
SIGNATURE	
DATE	May 26, 2000

/PAP

NY_MAIN 85688 v 1

PRINTING METHOD HAVING AUTO RETREAT FUNCTION
OF PRINT DATA AND MEDIUM FOR STORING
PROGRAM FOR EXECUTING THE PRINTING METHOD

5 BACKGROUND OF THE INVENTION

Field of the Invention

The invention relates to a printing method having an auto retreat function of print data and a medium for storing a program for executing the printing method.

10 Related Background Art

Hitherto, in an information processing system, a mechanism in which when expendable supplies such as papers or the like are absent and an error occurs during the execution of print data, a processing is suspended while processing information including the print data is held and when the expendable supplies are supplemented, the processing can be soon resumed has been provided, thereby improving a working efficiency of the user.

20 For example, it is assumed that papers of the A4 size and A3 size have been set in a printer and print data in which the B5 size was designated as a paper size has been sent from a host (host computer). The printer receives the print data and, at a point when it is detected that the B5 size whose papers are not set
25 has been designated, the printer enters an error status. According to the conventional technique, the

printer does not enter a status where the print data is abandoned and new print data can be processed but suspends the processing while a processing status so far is held and at a point when it is recognized that the expendable supplies have been supplemented, the printer resumes the processing. The user, therefore, can immediately obtain an output by setting papers into the printer. That is, after an error was recognized, the user does not need to perform work for sending the print data again from the host and can efficiently take a proper countermeasure against the error due to the absence of the expendable supplies.

According to the conventional technique, however, since the whole print processing is suspended at a point when the error occurs, not only the processing of the print data in which the error occurred but also the processing of the print data which is waiting to subsequently print is suspended. There is, consequently, a drawback of deterioration in print working efficiency of the other user.

For example, it is assumed that papers of the A4 size and A3 size have been set in a printer in Fig. 5. Print data A in which the B5 size was designated as a paper size is sent from a host A in Fig. 5 and, thereafter, print data B in which the A4 size was designated as a paper size is sent from a host B. In this case, according to the conventional technique, the

printer receives the print data A and at a point when
it is detected that the B5 size whose papers are not
set was designated, the printer enters the error status
and suspends the processing. The processing of the
5 print data B is also suspended at a point when the
print data B has been sent to the printer. That is, in
spite of the fact that the print data B can be printed
without causing an error because the A4 size whose
papers have been set in the printer is designated, the
10 print data B is influenced by the print data A which
was precedingly processed, so that the processing is
suspended.

If the user of the host A or the printer
administrator rapidly takes a countermeasure (the
15 papers are supplemented, the print data is cancelled,
or the like) against the print data A at this time
point, after the processing of the print data A, the
user of the host B can obtain an output of the print
data B. However, if a timing for taking the
20 countermeasure is delayed as in the case where the user
of the host A is not aware of the occurrence of the
error, the case where the papers of the B5 size cannot
be soon supplemented, or the like, the working
efficiency of the user of the host B remarkably
25 deteriorates.

It is assumed that there is a situation where the
printer in Fig. 5 is connected to the network and many

users frequently use the printer. In this case, the output of a large amount of print data (many users) has to be waited upon occurrence of the error and a range where the working efficiency deteriorates is widened.

5

SUMMARY OF THE INVENTION

The invention is made in consideration of the above circumstances.

That is, it is an object of the invention to
10 provide a printing method whereby by providing a function for retreating print data in the case where the print data cannot be printed, a printing of other print data is preferentially performed or when an apparatus enters a status where the print data can be
15 printed, the printing is enabled to be executed, thereby improving a printing working efficiency.

To accomplish the above object, according to a preferred aspect of the invention, there is provided a printing method of using a host which can set an auto
20 retreat of print data and a print output apparatus which is connected so that it can bidirectionally communicate with the host and is equipped with a memory device which can perform a retreat processing of the data in response to a request from the host, wherein
25 the host sends the print data to the print output apparatus, the print output apparatus receives the print data sent from the host and discriminates whether

the data can be normally printed or not on the basis of
print attributes of the received print data and a
status of the print output apparatus, when it is
determined that the data can be normally printed, the
printing is executed, and when it is determined that
the data cannot be normally printed, the print data is
retreated to the memory device in accordance with the
setting of the auto retreat, thereby enabling the
printing of other print data to be executed.

Another object of the invention is to provide a
medium for recording modules for executing the above
printing method.

The invention has the medium for recording modules
by the above printing method.

The above and other objects and features of the
present invention will become apparent from the
following detailed description and the appended claims
with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram showing a construction
of an information processing system to which a print
method of an embodiment of the invention is applied;

Fig. 2 is a diagram showing a state where modules
are supplied to a host from a medium on which the
modules in the embodiment of the invention have been
recorded;

Fig. 3 is a diagram showing a memory map in the case where the modules in the embodiment of the invention operate;

Fig. 4 is a constructional diagram of the medium
5 on which the modules in the embodiment of the invention have been recorded;

Fig. 5 is a conceptual diagram for explaining the print method in the embodiment of the invention;

Fig. 6 is a conceptual diagram for explaining the
10 print method in the embodiment of the invention;

Fig. 7 is a conceptual diagram for explaining the print method in the embodiment of the invention;

Fig. 8 is a conceptual diagram for explaining the print method in the embodiment of the invention;

Fig. 9 is a conceptual diagram for explaining the
15 print method in the embodiment of the invention;

Fig. 10 is a conceptual diagram for explaining the print method in the embodiment of the invention;

Figs. 11A, 11B, 11C, 11D, 11E and 11F are
20 conceptual diagrams for explaining the print method in the embodiment of the invention;

Figs. 12A, 12B and 12C are conceptual diagrams for explaining the print method in the embodiment of the invention;

Fig. 13 is a conceptual diagram for explaining the
25 print method in the embodiment of the invention;

Fig. 14 is a flowchart showing a flow of a control

in the invention;

Fig. 15 is a flowchart showing a flow of the control in the invention;

Fig. 16 is a flowchart showing a flow of the control in the invention;

Fig. 17 is a flowchart showing a flow of the control in the invention; and

Fig. 18 is a flowchart showing a flow of the control in the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Embodiments of the invention will now be described with reference to the drawings.

(Embodiment 1)

The following description will be made on the assumption that the printer in Fig. 5 has a storage which can perform a retreat processing of print data in response to a request from a host (computer) as a prerequisite. A connecting style of the hosts and the printer is also similarly applied to a style in which the hosts and the printers are connected in a one-to-one connecting relational manner or a style in which the printer is connected to a print server as shown in Fig. 6. For example, it is assumed that only the papers of the A4 size and the A3 size have been set in the printer in Fig. 5 and the printer is in a status where there is no staple although the printer has a

stapling function.

Modules which realize a main body of an apparatus have been installed in a disk 1033 in a storage 1030 of a host 10 in Fig. 1. It is assumed that when the host 10 is activated, the modules which realize the invention are read into an RAM 1031 in the storage 1030 in Fig. 1 and executed. The modules which execute the invention are program codes converted on the basis of flowcharts shown in Figs. 14 to 18.

The modules realizing the invention and the related data can be also loaded into the host 10 from a memory medium reader 1050 of the host 10 and executed. It is assumed that the modules realizing the invention and the related data have been recorded on a recording medium 20020 in Fig. 2 and have a recording construction as shown in Fig. 4. In this case, the modules realizing the invention and the related data recorded on the recording medium 20020 can be loaded into the host 10 via a memory medium reader 20010 in Fig. 2.

When the recording medium 20020 is set into the memory medium reader 20010 of the host 10, the modules realizing the invention and the related data are read out of the recording medium 20020 under the control of the OS and a basic I/O program, is loaded into the RAM in the storage 1030 of the host 10, and can be operated. Fig. 3 shows a memory map in a state where

the modules realizing the invention and the related data have been loaded into the RAM 1031 in the storage 1030 of the host 10 and can be operated.

5 The modules realizing the invention and the related data recorded on the recording medium 20020 in Fig. 2 can be temporarily stored (installed) into the disk 1033 or the like in the storage 1030 of the host 10 and can be loaded into the RAM 1031 in the storage 1030 of the host 10 from the disk 1033 or the like in 10 the storage 1030 of the host 10 each time the modules realizing the invention and the related data are made operative.

Although the host which sends the print data in which an error occurs and the host which sends the 15 print data in which no error occurs are different in Fig. 5, the invention can be also applied to a case where they are the same host.

The description of the invention is further made on the assumption of the following points as a 20 prerequisite.

That is, an auto retreat information table showing an error which can automatically retreat as shown in Fig. 13 has been stored in a disk 2033 in a storage 2030 of the printer in Fig. 1. The auto retreat 25 information table can be stored on the disk 1033 in the storage 1030 of the host 10 and can be downloaded into the printer when the host is activated.

The invention will now be described on the assumption of the above points.

First, a flow of processing of the host A in Fig. 5 will be described. First, the user designates a printing method in the host A in Fig. 5 and allows a display of the host A to display a print dialog (Fig. 7) of software (printer driver or the like) for making print data. In the example of Fig. 7, as attributes of the print data whose processing is started from now on, an all-page printing mode is designated by clicking a button 701 and the number of copies (namely, "1") is designated by clicking a button 702. An auto retreat flag is "set" by clicking a button 703. A paper size is set to "A4" by clicking a button 704. A stapling is set to "NO" by clicking a button 705. A single-sided printing or the like is set by clicking a button (double-sided) 706 to "NO". The user selects a "print" button 707 in the print dialog, so that a controller 1010 of the host in Fig. 1 starts a print processing (step 1401) shown in Fig. 14.

Reference numeral 708 denotes a "cancel" button of the printing. As mentioned above, the user can set whether the auto retreat is permitted or not on a print job unit basis on the display of the host.

The controller 1010 receives a print request from application, forms print data "TEST-1", and temporarily stores it into the RAM 1031 in the storage 1030 of the

host (step 1402). In the embodiment, it is assumed that the controller 1010 obtains the print data from the OS or application at this time point and temporarily stores it into the disk 1033 in the storage 1030 of the host 10. The print data can be successively obtained from the OS or application at a necessary time point.

The controller 1010 subsequently sets the auto retreat flag to the print data "TEST-1" stored in the RAM 1031 in the storage 1030 (step 1403).

The controller 1010 sends the print data "TEST-1" stored in the RAM 1031 in the storage 1030 to the printer as shown in Fig. 5 (step 1404). Actually, the controller 1010 transfers the print data "TEST-1" to a controller 2010 of the printer via a connector 1020 of the host 10 and a connector 2020 of a printer 20 in Fig. 1. At this time point, the print data "TEST-1" sent from the host A has been sent as shown in Fig. 9.

A flow of processing (refer to Fig. 15) in the printer in Fig. 5 will now be described.

The controller 2010 of the printer discriminates whether the print data has been received from the host or not (step 1501).

The controller 2010 of the printer subsequently determines that it received the print data from the host because the print data "TEST-1" has been received, and temporarily stores the print data "TEST-1" into an

RAM 2031 in the storage 2030 of the printer 20 (step 1502).

5 The controller 2010 of the printer subsequently inputs (updates) information (item of No. 1 in Fig. 11A) of the print data "TEST-1" into job execution management tables (Figs. 11A to 11F) which exist in the RAM 2031 in the storage 2030 of the printer and are used to manage the print processing (step 1503).

10 A flow (refer to Fig. 14) of the subsequent processing in the host A in Fig. 5 will be described.

15 The controller 1010 discriminates whether any notice has been received from the printer or not (step 1405). Since no notice is received from the printer at this time point, the controller 1010 determines that no notice is received.

20 The controller 1010 subsequently discriminates whether the processing for the sent print data "TEST-1" has been completed or not (step 1407). Specifically speaking, control data to obtain the status of the print data "TEST-1" sent from the controller 1010 is transferred to the controller 2010 of the printer via the connector 1020 of the host and the connector 2020 of the printer in Fig. 1.

25 A flow (refer to Fig. 15) of processing of the printer in Fig. 5 will now be described.

 The controller 2010 of the printer discriminates whether an inquiry has been received or not (step

1504). In this case, since the control data to obtain the status of the print data "TEST-1" has been received from the host A, the controller determines that the inquiry has been received. The controller 2010 of the printer analyzes the received control data and checks the control contents (step 1505). In the embodiment, since the control data is the control data to obtain the status of the sent print data "TEST-1", the controller 2010 of the printer analyzes the job execution management data stored in the RAM 2031 in the storage 2030 of the printer as shown in Figs. 11A to 11F. As a result of the analysis, the controller 2010 of the printer recognizes that the status of the relevant print data indicates that the data is being printed, and replies about the information to the controller 1010 via the connector 2020 of the printer and the connector 1020 of the host (step 1506).

A flow (refer to Fig. 14) of processing of the host A in Fig. 5 will now be described.

On the basis of the information replied in step 1407, the controller 1010 determines that the processing of the print data "TEST-1" is not completed. The processing routine is returned to step 1405.

A flow (refer to Fig. 15) of processing of the printer in Fig. 5 will now be described.

The controller 2010 of the printer checks job retreat management tables as shown in Figs. 12A to 12C

stored in the RAM 2031 in the storage 2030 of the printer in order to discriminate the presence or absence of a retreated job (step 1507). Since no information exists in the job retreat management tables
5 at this time point, it is determined that the automatically retreated job does not exist.

The controller 2010 of the printer subsequently checks the job execution management tables as shown in Figs. 11A to 11F stored in the RAM 2031 in the storage
10 2030 of the printer in order to discriminate the presence or absence of a print-waiting job (step 1508). Since the information of the print data "TEST-1" has been inputted at this time point in step 1503, it is determined that the print-waiting job exists.

15 It is assumed that the processing in steps 1401 to 1404 was executed in the hosts A and B after that and the printing was performed in the following order: namely, print data "SAMPLE-B" (attributes in which an auto retreat flag is turned "ON", a paper size is set
20 to "B4", a stapling is set to "NO", a printing mode is set to "single-sided printing", and the like) from the host B; print data "TEST-2" (attributes in which the auto retreat flag is turned "ON", the paper size is set to "A4", the stapling is set to "NO", the printing mode
25 is set to "single-sided printing", and the like) from the host A; and print data "SAMPLE-C" (attributes in which the auto retreat flag is turned "ON", the paper

size is set to "A3", the stapling is set to "YES", the printing mode is set to "single-sided printing", and the like) from the host B. Thus, the total four print data is held as execution jobs in the printer in Fig. 5 and it is assumed that the status in the printer is as shown in Fig. 9 and the job execution management table is as shown in a state of Fig. 11A.

Subsequently, the controller 2010 of the printer analyzes the print attributes of the head print data in the job execution management data stored in the RAM 2031 in the storage 2030 of the printer in order to start the processing of the print-waiting job (step 1601). Specifically speaking, the print attributes of the print data "TEST-1" are obtained.

Subsequently, the controller 2010 of the printer analyzes the status of the printer (step 1602). Specifically speaking, the size of paper set at present is checked, whether the papers of such a size exist or not is discriminated, and whether the other expendable supplies are absent or not are discriminated.

Subsequently, the controller 2010 of the printer discriminates whether the print data "TEST-1" can be normally printed or not (an error occurs or not) by collating the results in steps 1601 and 1602 (step 1603). In this case, since the print data "TEST-1" designates the paper size A4 of the papers which are set at present and the other print attributes are also

proper, the controller 2010 of the printer determines that the print data "TEST-1" can be normally printed (no error occurs).

5 Subsequently, the controller 2010 of the printer executes a part of the print processing of the print data "TEST-1" stored in the RAM 2031 in the storage 2030 of the printer (step 1605).

10 Subsequently, the controller 2010 of the printer discriminates whether the whole print processing of the print data which is at present being executed has been completed or not (step 1606). In this case, since the print data which is not processed yet exists, the controller 2010 of the printer determines that the whole print processing is not completed yet.

15 Subsequently, the controller 2010 of the printer updates the information of the job execution management table stored in the RAM 2031 in the storage 2030 of the printer (step 1608). Specifically speaking, the information indicative of an amount of processing which was executed, the status, and the like are updated. 20 The processing routine is returned to step 1501.

After that, the processing in steps 1501 to 1508 and the processing in steps 1601 to 1608 shown in Fig. 16 are repeated and the controller 2010 of the printer 25 determines that the whole print processing has been completed (step 1606).

Subsequently, the controller 2010 of the printer

deletes the print data whose processing has been finished from the RAM 2031 in the storage 2030 of the printer (step 1607). The controller 2010 updates (deletes) the information of the job (print data "TEST-1") of No. 1 in the job execution management table (A) as shown in Fig. 11A, so that the job execution management data changes as shown in Fig. 11B. The processing routine is returned to step 1501.

In order to start the processing of the print-waiting job, the controller 2010 of the printer analyzes the print attributes of the head print data in the job execution management table stored in the RAM 2031 in the storage 2030 of the printer (step 1601). Specifically speaking, the print attributes of the print data "SAMPLE-B" is obtained.

Subsequently, the controller 2010 of the printer analyzes the status of the printer (step 1602). Specifically speaking, the size of paper set at present is checked, whether the papers of such a size exist or not is discriminated, and whether the other expendable supplies are absent or not are discriminated.

Subsequently, the controller 2010 of the printer discriminates whether the print data "SAMPLE-B" can be normally printed or not (an error occurs or not) by collating the results in steps 1601 and 1602 (step 1603). In this case, since the print data "SAMPLE-B" designates the paper size B5 of the papers which are

not set at present, the controller 2010 of the printer determines that the print data "SAMPLE-B" cannot be normally printed (an error occurs).

Subsequently, the controller 2010 of the printer
5 checks the print data "SAMPLE-B" stored in the RAM 2031 in the storage 2030 of the printer to see if the auto retreat flag has been set (step 1604).

If the auto retreat flag is not set in the print data "SAMPLE-B", an operation similar to that in the
10 conventional apparatus is executed. The whole processing is temporarily suspended, the print processing is resumed at a point when the user supplements the expendable supplies, and an output can be soon obtained. Specifically speaking, the
15 controller 2010 of the printer suspends the print processing (step 1615).

The controller subsequently discriminates whether the cause of the error has been removed or not (step 1616). When the user supplements the expendable
20 supplies, step 1605 follows and the print processing is completed.

When it is determined that the cause of the error is not removed, the controller 2010 of the printer discriminates whether the cancel of the print data has
25 been instructed or not (step 1617). When the controller 2010 of the printer determined that the cancel of the print data has been instructed, step 1607

follows. When the controller 2010 of the printer determined that the cancel of the print data is not instructed, the processing routine is returned to step 1616 and the suspending status is allowed to continue.

5 In this case, since the auto retreat flag has been set in the print data "SAMPLE-B", an auto retreat information table as shown in Fig. 13 stored in the RAM in the storage 2030 of the printer is referred to (step 1609).

10 Subsequently, the controller 2010 of the printer analyzes the contents of the error which occurs at present and the auto retreat information table and discriminates whether the print data can be automatically retreated or not (step 1610). In this
15 case, since the cause of the error relates to "no paper" (the papers of the relevant paper size do not exist) in the auto retreat information table, it is decided that the print data can be retreated. If the
20 cause of the error does not exist in the auto retreat information table, step 1615 follows and processing is executed in a manner similar to the conventional technique.

 Subsequently, the controller 2010 of the printer suspends the print processing of the print data
25 "SAMPLE-B" (step 1611).

 Subsequently, the controller 2010 of the printer stores the print data "SAMPLE-B" as a retreated job

into the disk 2033 in the storage 2030 of the printer and the status in the printer becomes as shown in Fig. 9 (step 1612).

Subsequently, the controller 2010 of the printer
5 updates the information in the job retreat management table stored in the RAM 2031 in the storage 2030 of the printer (step 1613). Specifically speaking, the information of the print data "SAMPLE-B" is inputted and the job retreat management table changes as shown
10 in Fig. 12A.

Subsequently, the controller 2010 of the printer notifies the host of the fact that the print processing of the job has been suspended and the print data has been retreated (step 1614). Specifically speaking, the
15 cause of the suspension and the information indicating that the print data has been retreated are sent to the controller 1010 of the host B via the connector 2020 of the printer and the connector 1020 of the host B as an owner.

20 A flow of processing (refer to Fig. 14) of the host A in Fig. 5 will now be described.

The controller 1010 discriminates whether some notice has been received from the printer or not (step 1405). At this time point, it is decided that the
25 notice has been received from the printer, and the controller 1010 analyzes the contents of the notice and displays them to a display 1040 of the host (step

1406). Specifically speaking, for example, a dialog as shown in Fig. 8 is displayed. At least the reasons of the retreat and a method of cancelling the retreat are described in the dialog.

5 A flow of processing (refer to Fig. 16) of the printer in Fig. 5 will now be described.

 The controller 2010 of the printer updates the information in the job execution management table held in the RAM 2031 in the storage 2030 of the printer
10 (step 1608). Specifically speaking, the information of the print data "SAMPLE-B" whose print processing was suspended is deleted and the job execution management data changes as shown in Fig. 11C. The processing routine is returned to step 1501.

15 In this instance, although an error occurred in the print job "SAMPLE-B" and the processing was suspended, by automatically retreating the print data, the printer can be set into a status where the processing of the next print data can be started. That
20 is, even if the error occurred in the print data "SAMPLE-B", an influence that is exerted on the next print-waiting print job "TEST-2" (in other words, the processing of this job is made to wait) can be avoided.

 Subsequently, the controller 2010 of the printer
25 executes the processing in steps 1501 to 1507. Since the information of the print data "SAMPLE-B" has been inputted into the job retreat management data at this

time point as shown in Fig. 12A, the controller 2010 of the printer determines the presence of the retreated job in step 1507.

Subsequently, the controller 2010 of the printer
5 obtains the print attributes of the print data in the job retreat management table in the RAM 2031 in the storage 2030 of the printer (step 1701) in order to confirm whether the processing of the retreated job can be resumed or not.

10 Subsequently, the controller 2010 of the printer analyzes the printer status (step 1702). Specifically speaking, the size of paper set at present is checked, whether the papers of such a size exist or not is discriminated, and whether the other expendable
15 supplies are absent or not are discriminated.

Subsequently, the controller 2010 of the printer discriminates whether the print data "SAMPLE-B" can be normally printed or not (whether the print processing can be resumed or not) by collating the results in
20 steps 1701 and 1702 (step 1703). In this case, since the papers of the paper size B5 which are necessary to print the print data "SAMPLE-B" are not set, the controller 2010 of the printer determines that the
25 print data "SAMPLE-B" cannot be normally printed (the print processing cannot be resumed). The processing routine advances to step 1508.

Subsequently, the controller 2010 of the printer

checks the job execution management table as shown in
Figs. 11A to 11F stored in the RAM 2031 in the storage
2030 of the printer to see if the print-waiting job
exists (step 1508). Since the information of the print
5 data "TEST-2" and "SAMPLE-C" has been inputted at this
time point, the print-waiting job is determined to be
present.

Subsequently, the controller 2010 of the printer
analyzes the print attributes of the head print data in
10 the job execution management table stored in the RAM
2031 in the storage 2030 of the printer in order to
start the processing of the print-waiting job (step
1601). Specifically speaking, the print attributes of
the print data "TEST-2" are obtained. Since the print
15 attributes of the print data "TEST-2" indicate that no
error occurs, the processing in steps 1501 to 1508, the
processing in steps 1601 to 1608, and the processing in
1701 to 1703 are repeated, so that the whole print
processing is completed.

20 The controller 2010 of the printer updates the
information in the job execution management table
stored in the RAM 2031 in the storage 2030 of the
printer (step 1608). Specifically speaking, the
information of the print data "TEST-2" whose print
25 processing has been completed is deleted and the job
execution management table changes as shown in Fig.
11D. The processing routine is returned to step 1501.

Subsequently, the controller 2010 of the printer analyzes the print attributes of the head print data in the job execution management table stored in the RAM 2031 in the storage 2030 of the printer in order to start the processing of the print-waiting job (step 1601). Specifically speaking, the print attributes of the print data "SAMPLE-C" are obtained. Since the print attributes of the print data "SAMPLE-C" indicate "stapling", the controller 2010 of the printer determines that the print data cannot be normally printed (an error occurs) in step 1603.

Subsequently, the controller 2010 of the printer checks the print data "SAMPLE-C" stored in the RAM 2031 in the storage 2030 of the printer in order to discriminate whether the auto retreat flag has been set to ON or not (step 1604).

In this case, since the auto retreat flag has been set in the print data "SAMPLE-C", the auto retreat information table stored in the RAM 2031 in the storage 2030 of the printer is referred to (step 1609).

Subsequently, the controller 2010 of the printer analyzes the contents of the error occurring at present and the auto retreat information table and discriminates whether the print data can be automatically retreated or not (step 1610). In this case, since the cause of the error relates to "no staple" (staples which are used to staple do not exist)

in the auto retreat information table, it is decided that the print data can be retreated.

Subsequently, the controller 2010 of the printer suspends the print processing of the print data "SAMPLE-C" (step 1611).

Subsequently, the controller 2010 of the printer stores the print data "SAMPLE-C" into the disk in the storage 2030 of the printer (step 1612).

Subsequently, the controller 2010 of the printer updates the information in the job retreat management table stored in the RAM 2031 in the storage 2030 of the printer (step 1613). Specifically speaking, the information of the print data "SAMPLE-C" is inputted and the job retreat management table changes as shown in Fig. 12B.

Subsequently, the controller 2010 of the printer notifies the host of the fact that the print processing of the job has been suspended and the print data has been retreated (step 1614). Specifically speaking, the cause of the suspension and the information indicating that the print data has been retreated are sent to the controller 1010 via the connector 2020 of the printer and the connector 1020 of the host B as an owner. The information is displayed on the display 1040 in the host B.

The controller 2010 of the printer updates the information in the job execution management table held

in the RAM 2031 in the storage 2030 of the printer
(step 1608). Specifically speaking, since the
information of the print data "SAMPLE-C" whose print
processing was suspended is deleted, the contents of
5 the information in the job execution management table
are deleted. The processing routine is returned to
step 1501.

Initially, four print-waiting print data exists in
order of "TEST-1", "SAMPLE-B", "TEST-2", and "SAMPLE-
10 C". However, at this time point, the printing of the
print data "TEST-1" and "TEST-2" in which no error
occurs has been completed and the print data "SAMPLE-B"
and "SAMPLE-C" in which there is no expendable supplies
and the error occurred has been retreated and held in
15 the printer.

It is assumed that the user has set the papers of
the B5 size into the printer in this status. The
controller 2010 of the printer executes the processing
in steps 1501 to 1507. At this time point, since the
20 information of the print data "SAMPLE-B" and "SAMPLE-C"
has been inputted in the job retreat management table
as shown in Fig. 12B, the controller 2010 of the
printer determines that the retreated job exists in
step 1507.

25 Subsequently, the controller 2010 of the printer
analyzes the print attributes in the job retreat
management table stored in the RAM 2031 in the storage

2030 of the printer in order to confirm whether the processing of the retreated job can be resumed or not (step 1701). Specifically speaking, the print attributes of the print data "SAMPLE-B" and "SAMPLE-C" are obtained.

Subsequently, the controller 2010 of the printer analyzes the printer status (step 1702). Specifically speaking, the size of paper set at present is checked, whether the papers of such a size exist or not is discriminated, and whether the other expendable supplies are absent or not are discriminated.

Subsequently, the controller 2010 of the printer discriminates whether the print data "SAMPLE-B" and "SAMPLE-C" can be normally printed or not (whether the print processing can be resumed or not) by collating the results in steps 1701 and 1702 (step 1703). In this case, since the papers of the paper size B5 necessary for printing have been set only for the print data "SAMPLE-B", the controller 2010 of the printer determines that the print data can be normally printed (print processing can be resumed).

Subsequently, the controller 2010 of the printer restores (copies) the print data "SAMPLE-B" stored in a memory device in the storage 2030 of the printer into the RAM 2031 in the storage 2030 of the printer. The controller 2010 of the printer deletes the print data "SAMPLE-B" stored in the memory device in the storage

2030 of the printer (step 1704).

Subsequently, the controller 2010 of the printer updates the information in the job retreat management table stored in the RAM 2031 in the storage 2030 of the printer (step 1705). Specifically speaking, the information of the print data "SAMPLE-B" is deleted, so that the job retreat management table changes as shown in Fig. 12C.

Subsequently, the controller 2010 of the printer updates the information in the job execution management table stored in the RAM 2031 in the storage 2030 of the printer (step 1706). Specifically speaking, the information of the print data "SAMPLE-B" whose print processing was resumed is inputted and the job execution management table changes as shown in Fig. 11E. The processing routine advances to step 1508.

After that, the controller 2010 of the printer repeats the processing in steps 1501 to 1508 and the processing in steps 1601 to 1608 and outputs the print data "SAMPLE-B". The controller 2010 of the printer determines that the whole print processing has been completed in step 1606.

It is assumed that the user has set the staples into the printer in this status. The controller 2010 of the printer executes the processing in steps 1501 to 1507. At this time point, since the information of the print data "SAMPLE-C" has been inputted into the job

retreat management table as shown in Fig. 12C, the controller 2010 of the printer decides that the retreated job exist in step 1507.

Subsequently, the controller 2010 of the printer
5 analyzes the print attributes of the print data in the job retreat management table held in the RAM 2031 in the storage 2030 of the printer in order to confirm whether the processing of the retreated job can be resumed or not (step 1701). Specifically speaking, the
10 print attributes of the print data "SAMPLE-C" are obtained.

Subsequently, the controller 2010 of the printer analyzes the printer status (step 1702). Specifically speaking, the size of paper set at present is checked,
15 whether the papers of such a size exist or not is discriminated, and whether the other expendable supplies are absent or not are discriminated.

Subsequently, the controller 2010 of the printer discriminates whether the print data "SAMPLE-C" can be
20 normally printed or not (whether the print processing can be resumed or not) by collating the results in steps 1701 and 1702 (step 1703). In this case, since the staples necessary for printing the print data "SAMPLE-C" have been set, the controller 2010 of the
25 printer determines that the print data can be normally printed (print processing can be resumed).

Subsequently, the controller 2010 of the printer

restores (copies) the print data "SAMPLE-C" stored in the memory device in the storage 2030 of the printer into the RAM 2031 in the storage 2030 of the printer. The controller 2010 of the printer deletes the print data "SAMPLE-C" stored in the memory device in the storage 2030 of the printer (step 1704).

Subsequently, the controller 2010 of the printer updates the information in the job retreat management table stored in the RAM 2031 in the storage 2030 of the printer (step 1705). Specifically speaking, since the information of the print data "SAMPLE-C" is deleted, the contents of the information in the job retreat management table are fully deleted.

Subsequently, the controller 2010 of the printer updates the information in the job execution management table stored in the RAM 2031 in the storage 2030 of the printer (step 1706). Specifically speaking, the information of the print data "SAMPLE-C" whose print processing was resumed is inputted and the job execution management table changes as shown in Fig. 11F. The processing routine advances to step 1508.

After that, the controller 2010 of the printer repeats the processing in steps 1501 to 1508 and the processing in steps 1601 to 1608 and outputs the print data "SAMPLE-C". The controller 2010 of the printer determines that the whole print processing has been completed in step 1606.

A message indicating that all of the printable jobs have already been completed (deleted) in the printer status at that time point can be notified to the host as an owner of the retreated job and displayed
5 before the retreated job is executed.

(Embodiment 2)

As an embodiment 2, it is possible to improve a method of taking a countermeasure against the resume of the printing of the retreated print data.

10 In the embodiment 1, the user actually supplements the expendable supplies, thereby allowing the print attributes to be satisfied and allowing the print processing of the retreated print data to be automatically resumed.

15 According to the embodiment 2, a utility for changing the print attributes of the print data which was retreated and held in the printer from the host by a remote operation is provided. By this utility, the print attributes in which an error occurs are changed
20 so as to be adapted to the present printer status, thereby allowing the print processing to be resumed. Specifically speaking, the utility having a user interface as shown in Fig. 10 is provided and processing in steps 1801 to 1804 is executed.

25 It is now assumed that the print job "SAMPLE-C" has been retreated as shown in the job retreat management table in Fig. 12C.

The controller 1010 of the host obtains the information of the retreated job in the printer with reference to the job retreat management table of the printer (step 1801).

5 Subsequently, the controller 1010 of the host displays the information of the retreated job in the printer onto the display 1040 in a form as shown in Fig. 10 on the basis of the information obtained from the printer (step 1802).

10 Subsequently, the controller 1010 of the host discriminates whether the user has instructed to change the print attributes of an arbitrary job by an input unit 1070 of the host or not (step 1803).

15 For example, it is assumed that the user changed the item "stapling" in Fig. 10 from "YES" to "NO". In this case, the controller 1010 of the host determines that the user instructed to change the print attributes of the job, so that it sends control data for changing the print attributes to the printer (step 1804). Thus,
20 no error occurs in the print data "SAMPLE-C" and the print processing is restarted.

 By the above operation, the print processing of the print data which was retreated and held can be easily resumed from a remote place. Even if the
25 various component elements described as examples in the foregoing embodiments are replaced with the following component elements, they will be valid.

Printer..... Plotter, copying apparatus, facsimile,
etc.

Host..... Personal computer, workstation,
minicomputer, etc.

5 Controller.. Software, ROM, RAM, etc.

Connector... Serial interface board, parallel
interface board, network interface
board, etc.

Storage..... Memory, magnetic disk device,
10 magneto optic disk device, magnetic
tape device, etc.

Printer..... Laser beam system, bubble jet system,
LED system, thermal transfer system,
etc.

15 Display..... CRT, LCD, etc.

Input unit.. Keyboard, mouse, track ball, etc.

Memory medium reader.. FD device, MO device, CD-ROM
device, IC memory card device, etc.

Recording medium.. FD, MO, CD-ROM, IC memory card,
20 etc.

As described above, according to the printing
method and medium of the invention, there is such an
effect that when an error occurs due to the cause of
25 absence of the expendable supplies, by automatically
retreating and holding the print data, the
deterioration of the working efficiency of the print-

waiting print data (the other users) can be avoided. There is also such an effect that the resources of the shared memory device and the like of the printer are utilized and the working efficiency is improved.

5 There are such effects that the print processing
of the print data which was retreated and held can be
easily resumed from a remote place and a using
efficiency is improved.

WHAT IS CLAIMED IS:

1. A printing method carried out in a host which
can set an auto retreat of print data and a printing
apparatus connected in bidirectional communication with
5 the host, wherein the printing apparatus is equipped
with a memory device and can perform a data retreat
processing in response to a request from the host,
comprising the steps of:

causing the host to start a print processing;
10 causing the host to form print data;
causing the host to set an auto retreat flag;
causing the host to send the formed print data;
causing the host to discriminate whether a notice
has been received from the printing apparatus;
15 causing the host to displays contents of the
received notice; and
causing the host to discriminate whether the print
processing has been completed in the printing
apparatus.

20

2. A method according to claim 1, further
comprising the steps of:

causing the printing apparatus to discriminate
whether the print data sent from the host has been
25 received;

causing the printing apparatus to temporarily
store the received print data;

print data; and

causing the printing apparatus to update the job execution management table.

5 4. A method according to claim 3, wherein when it is determined that the print data cannot be normally printed, said method further executes the steps of:

causing the printing apparatus to discriminate whether the auto retreat flag has been set;

10 causing the printing apparatus to discriminate whether the print data can be automatically retreated referring to an auto retreat information table;

causing the printing apparatus to suspend the print processing;

15 causing the printing apparatus to retreat and hold the print data;

causing the printing apparatus to update a job retreat management table; and

20 causing the printing apparatus to notify the host that the job has been suspended and retreated.

25 5. A method according to claim 4, wherein when the auto retreat flag is not set and the print data cannot be automatically retreated, said method further executes the steps of:

causing the printing apparatus to suspend the print processing;

causing the printing apparatus to discriminate whether an error has been removed; and

causing the printing apparatus to discriminate whether the print data has been cancelled.

5

6. A method according to claim 2, wherein when it is determined that the retreated job does not exist, said method further executes the steps of:

causing the printing apparatus to analyze the print attributes of the print data in a job retreat management table;

causing the printing apparatus to analyze the status of the printing apparatus;

causing the printing apparatus to discriminate whether the print data can be normally printed;

causing the printing apparatus to restore and delete the print data;

causing the printing apparatus to update the job retreat management table; and

causing the printing apparatus to update the job execution management table.

7. A method according to claim 4, wherein when it is determined that the print data cannot be normally printed, said method further executes the steps of:

causing the host to obtain information on the retreated job in the printing apparatus;

causing the host to display the obtained
information;

causing the host to discriminate whether a change
in attributes of the job has been instructed; and

5 causing the host to send the attributes to be
changed to the printing apparatus.

8. A printing method carried out in a host which
can set an auto retreat of print data and a printing
10 apparatus connected in bidirectional communication with
the host, wherein the printing apparatus is equipped
with a memory device and can perform a data retreat
processing in response to a request from the host,
comprising the steps of:

15 causing the host to send print data to the
printing apparatus;

causing the printing apparatus to receive the
print data sent from the host;

causing the printing apparatus to discriminate
20 whether the print data can be normally printed on the
basis of print attributes of the received print data
and a status of the printing apparatus;

causing the printing apparatus to execute the
printing when it is determined that the print data can
25 be normally printed; and

causing the printing apparatus to allow the print
data to be retreated into the memory device in

accordance with an auto retreat setting when it is determined that the print data cannot be normally printed, thereby enabling other print data to be printed.

5

9. A method according to claim 8, wherein said method causes the printing apparatus to discriminate whether the auto retreat setting exists when it is determined that the print data cannot be normally
10 printed, to suspend the print processing and retreat the print data when it is determined that the auto retreat setting exists, and to suspend the print processing when it is determined that the auto retreat setting does not exist.

15

10. A method according to claim 9, wherein said method causes the printing apparatus to manage the execution of the printing of the retreated print data as a retreat job and discriminate whether the retreated
20 job exists upon retreating the print data, to discriminate whether the print data can be normally printed on the basis of the print attributes of the print data and the status of the printing apparatus when the retreated job exists, to manage the retreated
25 job as an execution job when it is determined that the print data can be normally printed, and to discriminate whether a print-waiting job exists when it is

determined that the print data cannot be normally printed.

11. A method according to claim 10, wherein said
5 method causes the printing apparatus to discriminate
whether the print data can be normally printed on the
basis of the print attributes of the print data and the
status of the print output apparatus when it is
determined that the print-waiting job exists, to
10 execute the printing when it is decided that the print
data can be normally printed, and to allow the print
data to be retreated into the memory device in
accordance with the auto retreat setting when it is
determined that the print data cannot be normally
15 printed.

12. A method according to claim 8, wherein when
the print data is retreated into the memory device,
said method causes the printing apparatus to notify the
20 host of a situation of the retreat of the print data,
and wherein the host can change the print attributes in
accordance with the retreat situation obtained from the
printing apparatus and said method causes the host to
send the print attributes to the printing apparatus
25 when the print attributes are changed.

13. A method according to claim 12, wherein when

the print data with the print attributes changed is received from the host, said method causes the printing apparatus to execute the processing in accordance with the print attributes and the status of the print output apparatus.

14. A computer-readable memory medium which stores a program having a function for instructing an auto retreat of print data to a printer, wherein the program comprises:

a code for allowing the user to select one of validation and invalidation of an auto retreat function on a display device; and

a code for allowing the print data to be sent together with information indicating validation or invalidation of the auto retreat function selected by the user.

15. A medium according to claim 14, wherein the program further comprises a code for allowing a message to be displayed on the display device, the message indicating that the printer has executed the auto retreat.

16. A medium according to claim 14, wherein the program further comprises a code for allowing a message to be displayed on the display device, the message

indicating that the printer has printed print data not automatically retreated.

ABSTRACT OF THE DISCLOSURE

An object of the invention is to provide a printing method whereby a function for retreating print data in the case where the print data cannot be printed is provided, and the printing of other print data is preferentially performed or a printing is enabled to be executed when an apparatus enters a printable status of the print data, thereby improving a print working efficiency. To accomplish this object, there is provided a printing method of using a host which can set an auto retreat of print data and a print output apparatus which is connected so that it can bidirectionally communicate with the host and is equipped with a memory device which can perform a retreat processing of the data in response to a request from the host, wherein the host sends the print data to the print output apparatus, the print output apparatus receives the print data sent from the host and checks whether the data can be normally printed or not on the basis of print attributes of the received print data and a status of the print output apparatus, when it is decided that the data can be normally printed, the printing is executed, and when it is decided that the data cannot be normally printed, the print data is retreated to the memory device in accordance with the setting of the auto retreat, thereby enabling the printing of other print data to be executed.

FIG. 1

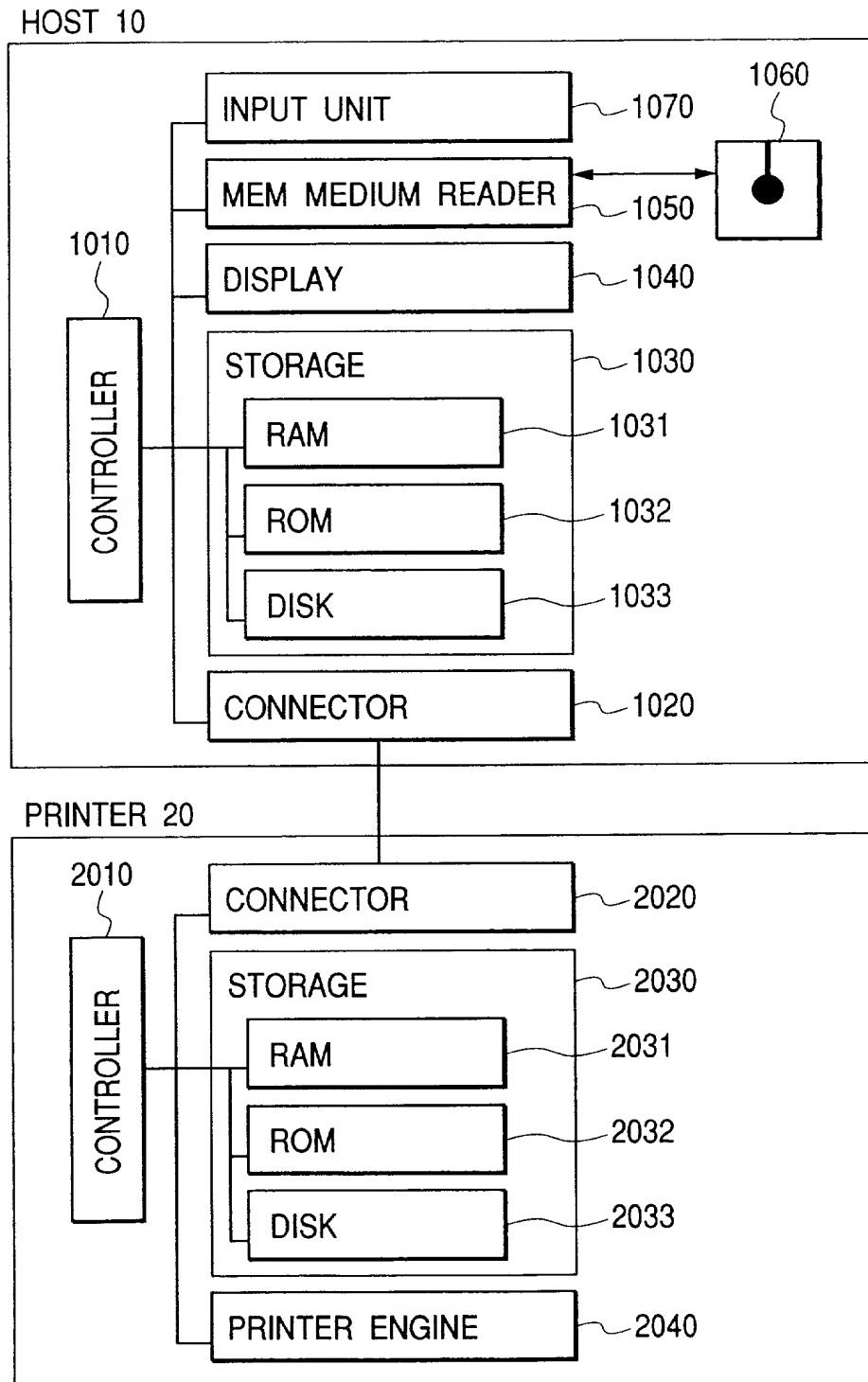


FIG. 2

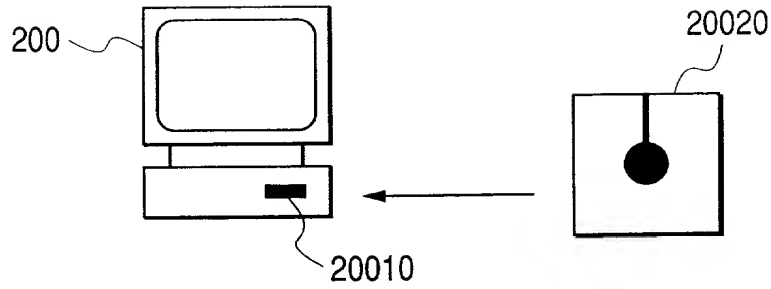


FIG. 3

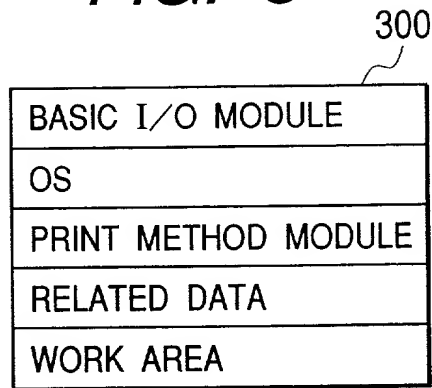


FIG. 4

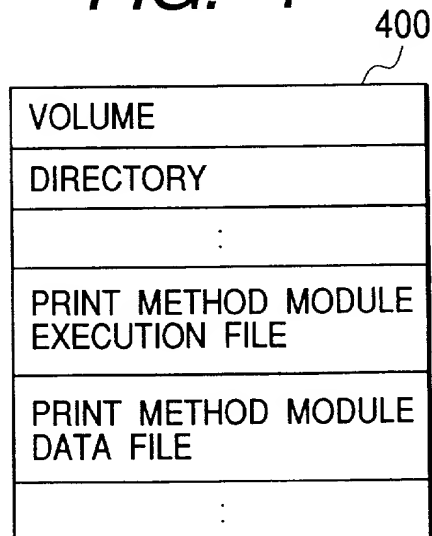


FIG. 5

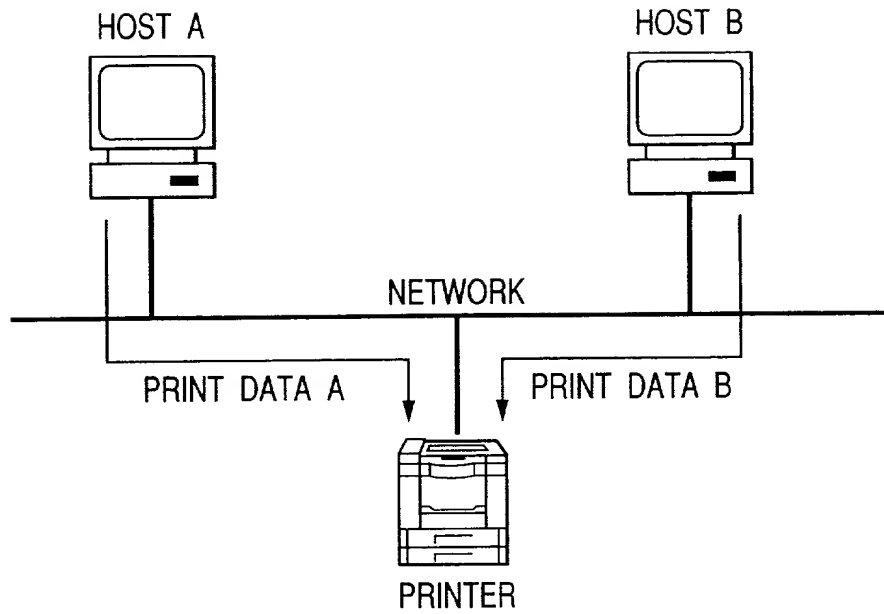


FIG. 6

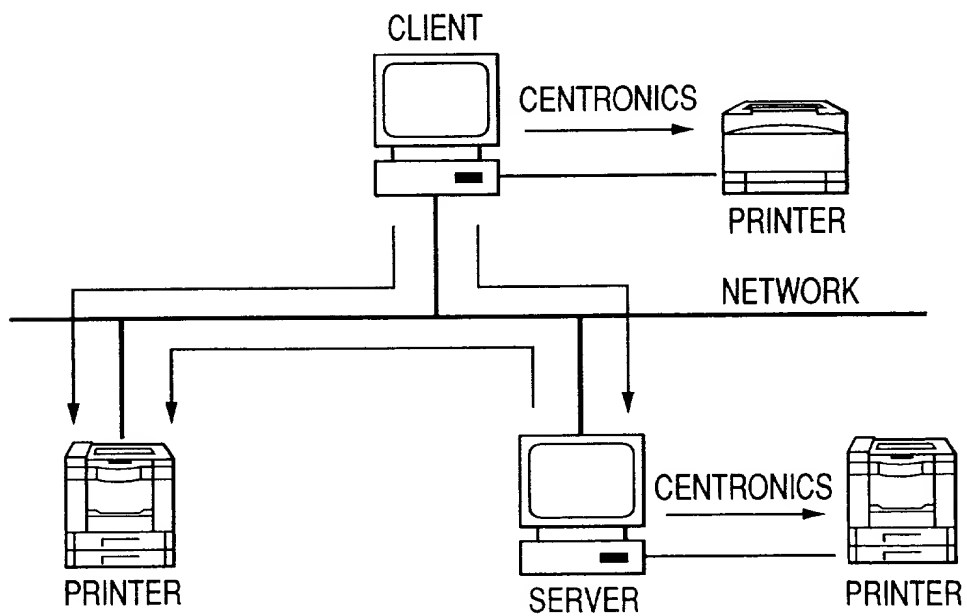
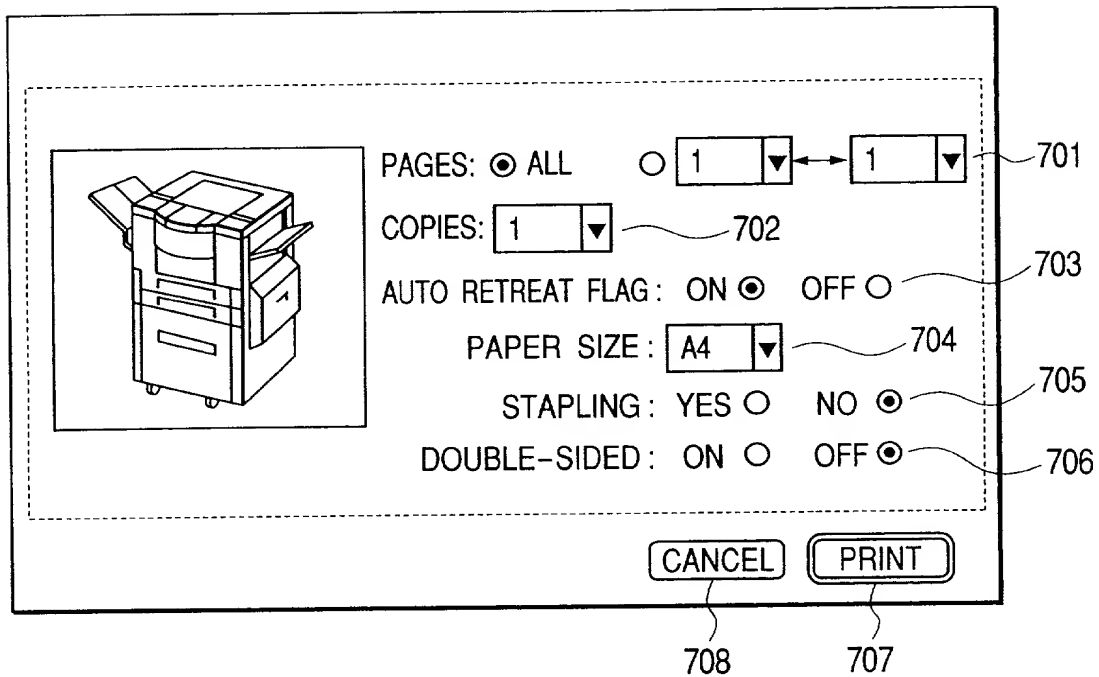


FIG. 7


PAGES: ☒ ALL ☐ 1 ↔ 1 701
 COPIES: 1 702
 AUTO RETREAT FLAG: ON ☒ OFF ☐ 703
 PAPER SIZE: A4 704
 STAPLING: YES ☐ NO ☒ 705
 DOUBLE-SIDED: ON ☐ OFF ☒ 706
 CANCEL 708 PRINT 707

FIG. 8

B5 PAPER(S) IS/ARE ABSENT IN DESIGNATED PAPER SUPPLY,
 SO YOUR PRINTING IS SUSPENDED AND PRINT DATA IS
 RETREATED IN PRINTER. PRINTING WILL BE RESUMED UPON
 SETTING B5 PAPER(S). UNTIL THEN, OTHER PRINT DATA IN
 SPOOL IS PROCESSED FIRST.

OK

FIG. 9

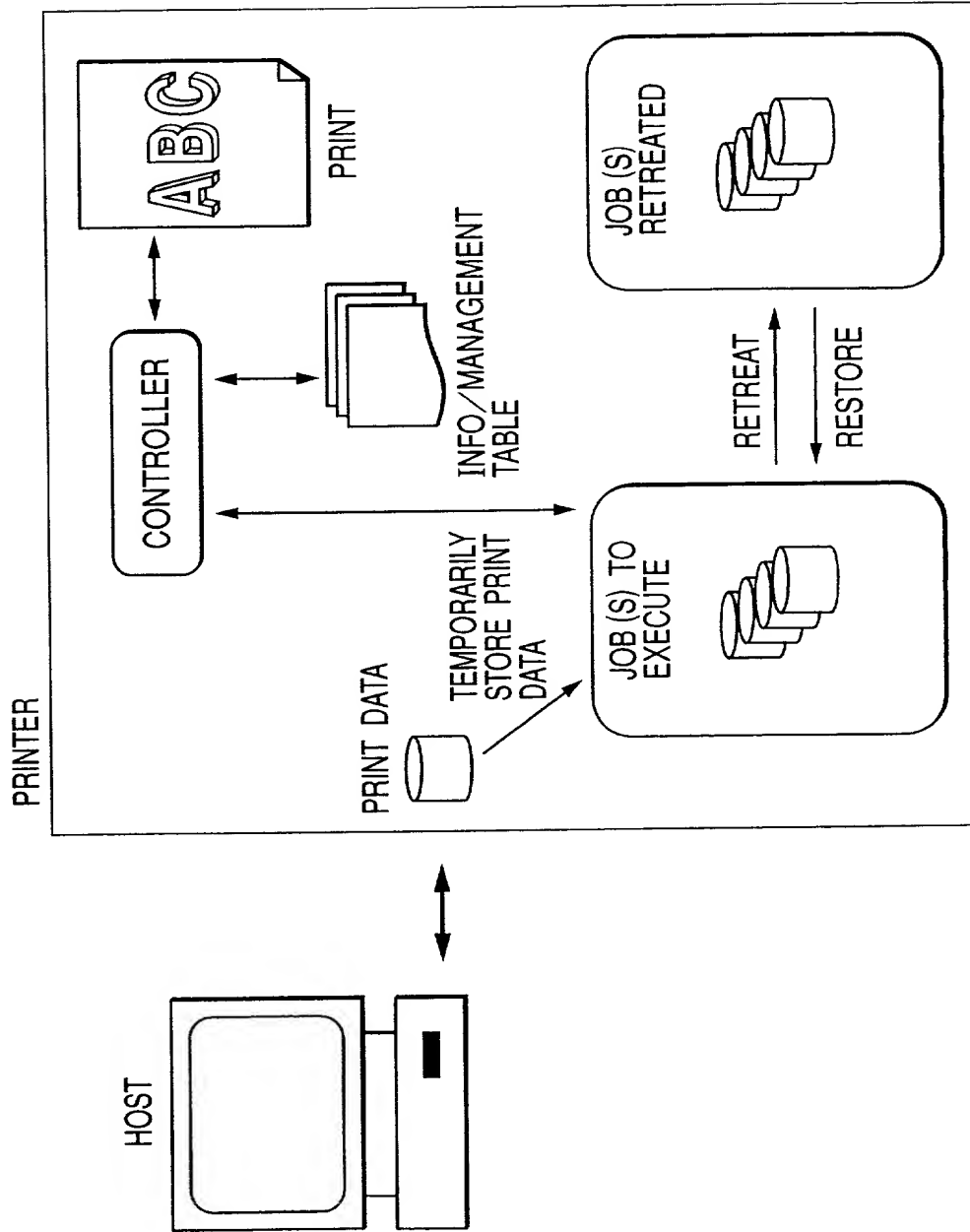


FIG. 10

PRINT: ☒ SINGLE-SIDED ☐ DOUBLE-SIDED

PAPER SUPPLY: ☐ UPPER CASSETTE ☒ LOWER CASSETTE

STAPLING: ☒ YES ☐ NO

EJECTION PORT: ☒ AUTO ☐ BIN-1 ☐ BIN-2 ☐ BIN-3

[JOB]	[OWNER]	[STATUS]	[SIZE]	[ATTRIBUTES]
SAMPLE-C	B	RETREATED	XXKB	A3/SINGLE-SIDED/STAPLING/...

JOB RETREAT MANAGEMENT TABLE A

NO.	ID	JOB	OWNER	PRINT DATA	JOB ATTRIBUTE	STATUS	:
1	ID=981010-20	SAMPLE-B	B	¥FILE-B1	B5/SINGLE-SIDED/NO STAPLING/...	RETREATED	:

FIG. 12A

JOB RETREAT MANAGEMENT TABLE B

NO.	ID	JOB	OWNER	PRINT DATA	JOB ATTRIBUTE	STATUS	:
1	ID=981010-20	SAMPLE-B	B	¥FILE-B1	B5/SINGLE-SIDED/NO STAPLING/...	RETREATED	:
2	ID=981010-40	SAMPLE-C	B	¥FILE-B2	A3/SINGLE-SIDED/STAPLING/...	RETREATED	:

FIG. 12B

JOB RETREAT MANAGEMENT TABLE C

NO.	ID	JOB	OWNER	PRINT DATA	JOB ATTRIBUTE	STATUS	:
1	ID=981010-40	SAMPLE-C	B	¥FILE-B2	A3/SINGLE-SIDED/STAPLING/...	RETREATED	:

FIG. 12C

FIG. 13

AUTO RETREAT INFO TABLE

ITEM	CONTENTS
NO PAPER	NO PAPER OF DESIGNATED SIZE
NO STAPLE	NO STAPLE FOR STAPLING
PORT-FULL	EJECTION PORT IS FULL OF PRINTED PAPERS; FURTHER EJECTION IS IMPOSSIBLE
PORT-PAPER	PRINTED PAPER(S) IS/ARE IN EJECTION PORT; FURTHER EJECTION WILL CAUSE MIXED PAPERS
TONER-LOW	TONER AMOUNT IS LOW; PRINT QUALITY WILL BE POOR
:	:

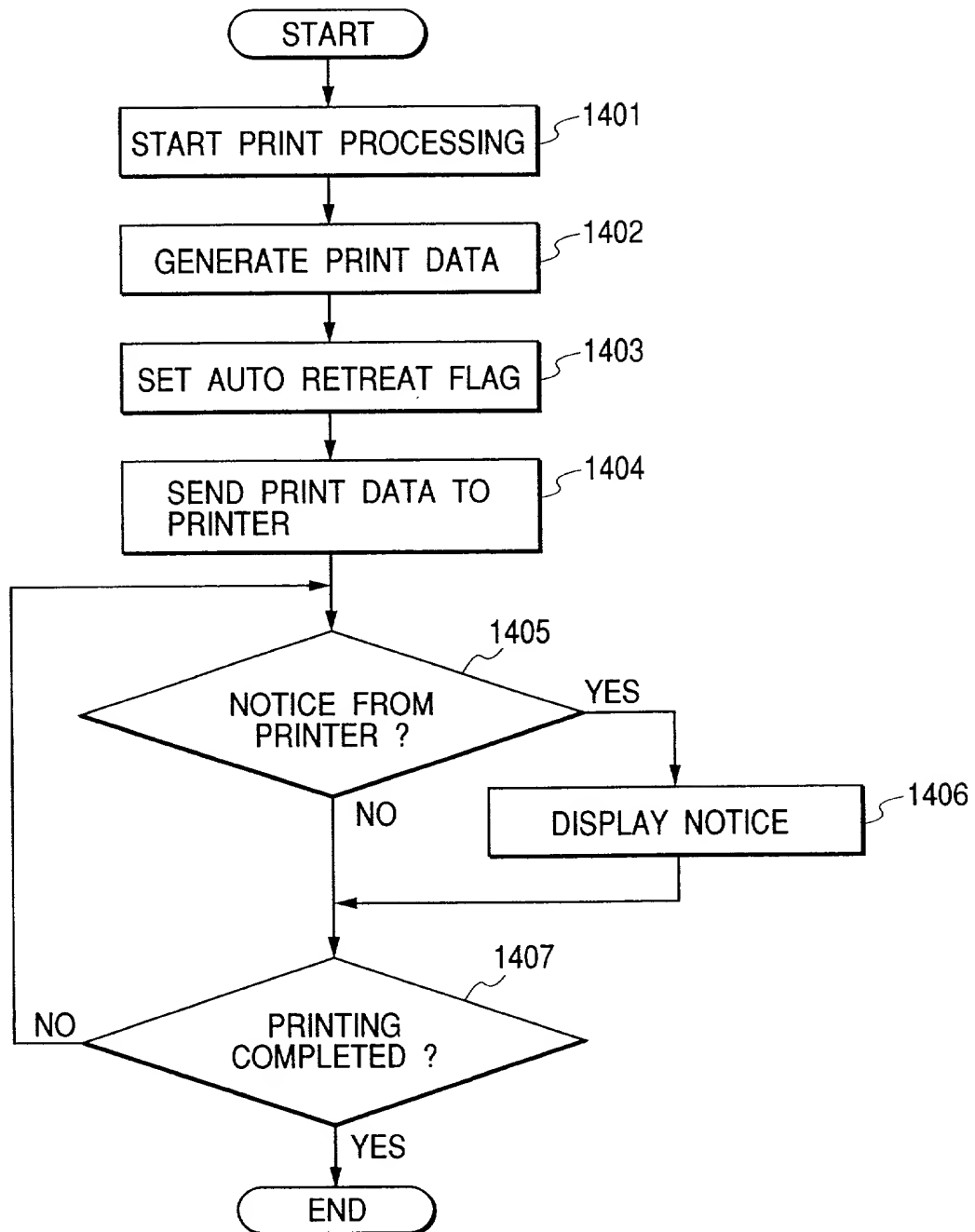
FIG. 14

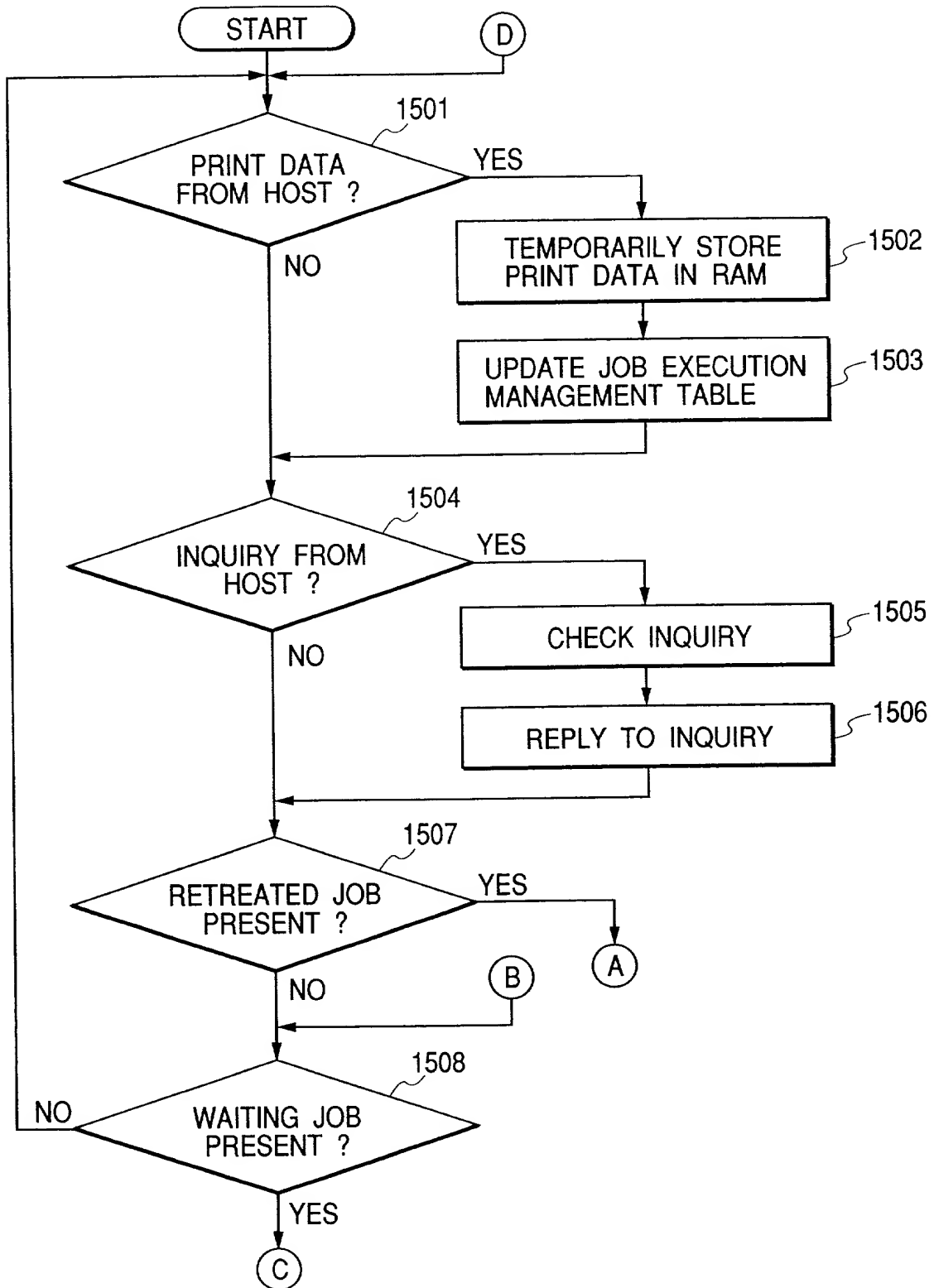
FIG. 15

FIG. 16

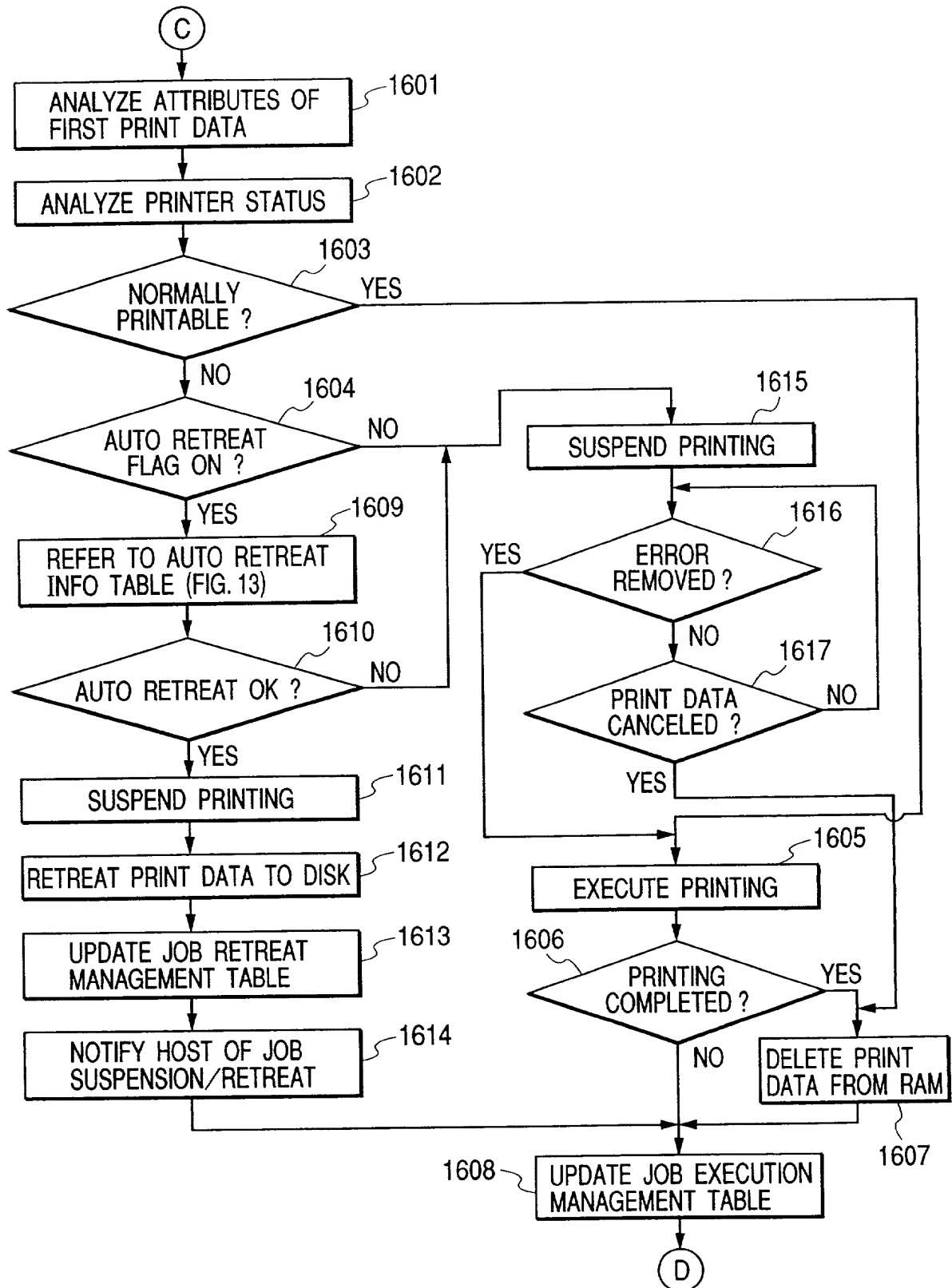


FIG. 17

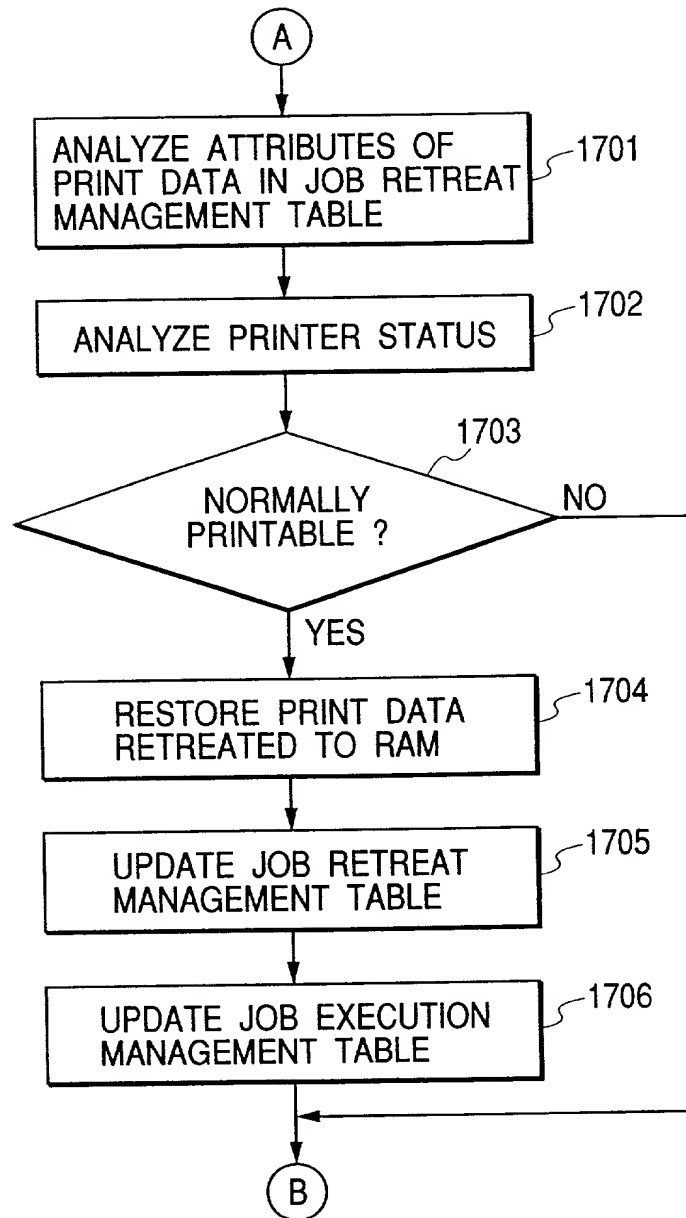
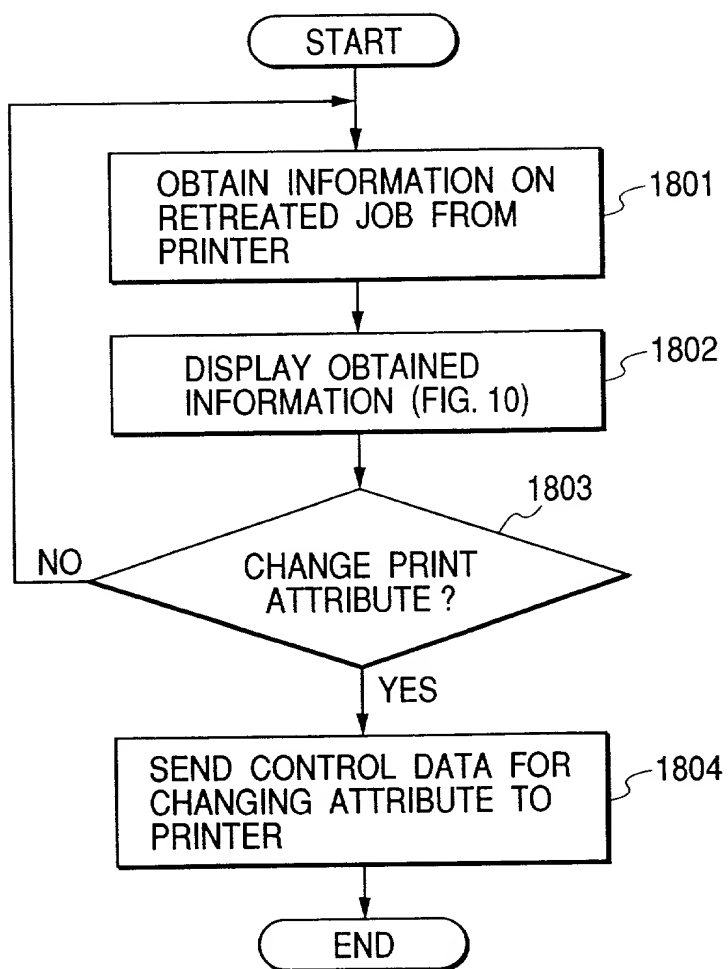


FIG. 18

CP014310

**COMBINED DECLARATION AND POWER OF ATTORNEY
FOR PATENT APPLICATION**
(Page 1)

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled PRINTING METHOD HAVING AUTO RETREAT FUNCTION OF PRINT DATA AND MEDIUM FOR STORING PROGRAM FOR EXECUTING THE PRINTING METHOD

the specification of which ☒ is attached hereto ☐ was filed on _____ as United States Application No. or PCT International Application No. _____ and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR §1.56.

I hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or §365(b), of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT international application which designates at least one country other than the United States, listed below and have also identified below any foreign application for patent or inventor's certificate, or PCT international application having a filing date before that of the application on which priority is claimed:

<u>Country</u>	<u>Application No.</u>	<u>Filed (Day/Mo./Yr.)</u>	<u>(Yes/No) Priority Claimed</u>
JAPAN	11-154538	2 June 1999	Yes

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s), or § 365(c) of any PCT international application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

<u>Application No.</u>	<u>Filed (Day/Mo./Yr.)</u>	<u>Status (Patented, Pending, Abandoned)</u>
------------------------	----------------------------	--

I hereby appoint the practitioners associated with the firm and Customer Number provided below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and direct that all correspondence be addressed to the address associated with that Customer Number:

FITZPATRICK, CELLA, HARPER & SCINTO
Customer Number: 05514

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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